

Jan. 1908. *Ring-extension on disappearance of Saturn's Ring.* 209

No.	B.D.	R.A. 1900.	Decl.	P.	D.	Mags.	Nights.	Date.
		h m						1907.
536	...	22 20.4	+26 54	270.1	2.97	10.2 10.2	2	.673
537	+49,3855	23.2	50 9	19.7	2.27	9.2 9.4	2	.806
538	+46,3716	24.7	46 24	66.8	3.40	9.1 10.5	2	.889
539	+42,4437	28.3	42 36	287.7	6.10	9.1 11.0	3	.836
540	+48,3762	28.7	48 26	281.5	1.30	9.1 9.9	3	.709
541	+25,4787	35.9	26 13	220.3	6.61	8.0 12.4	4	.751
542	+49,3968	48.9	49 29	282.6	5.05	8.7 10.5	3	.710 AB
				83.9	57.88	C = 8.8	2	.708 AC
543	+46,3945	23 3.8	46 58	22.0	3.87	9.2 10.5	2	.783
544	+49,4054	4.2	49 22	245.6	2.30	9.5 9.7	2	.951
	+25,4927	17.5	25 22	264.4	19.95	6.7 13.0	2	.713
545	+48,4024	18.9	48 44	319.7	9.70	8.1 12.0	3	.755
546	+26,4623	20.1	26 24	162.2	2.37	9.1 10.8	3	.683
547	+46,4096	31.9	46 46	237.1	6.95	8.5 12.0	2	.795
548	+46,4139	39.8	46 54	315.9	14.37	8.5 8.8	2	.835
549	+47,4264	40.0	47 57	51.7	8.10	8.5 13.7	2	.704 AB
				238.7	16.07	C = 9.0	2	.704 AC
550	+45,4323	41.8	46 7	167.2	17.35	8.6 8.9	2	.814
551	+47,4313	23 49.5	47 41	311.6	4.72	11.7 12.7	2	.834 BC
				11.4	24.60	a = 10.5	1	.865 Aa
				88.1	30.90	A = 8.6	2	.834 AB

Appearance of Ring-extension during the disappearance of Saturn's Ring, Oct.-Nov. 1907. By R. T. A. Innes.

As Professor Campbell's observation of the appearance of Saturn's ring will give rise to some discussion, I do not delay sending the notes I have made so far. The telescope used is the 9-inch Grubb refractor mentioned in an earlier note. Sir Howard Grubb has supplied it with a double concave eyepiece of high magnifying power, which transmits at least twice as much light as an ordinary eyepiece. This negative eyepiece gives an erect image; its only drawback is an excessively small field.

On several occasions Mr. R. N. Kotze, my son and myself noticed the beaded appearances referred to by Professor Campbell, but we assumed that they were caused by either Mimas or Enceladus, and our curiosity did not lead us further.

I now give, without further comment, the exact notes made by myself at the telescope:—

1907 Oct. 16. Ring seen at moments.

17. Ring all but held steadily. It is very faint and not full length.

- 1907 Oct. 21. Extension of ring clearly seen on f. side ; not so distinct on p. side, but Titan and other satellites near.

Although I refer to the appearance as the "Ring" on the 16th and 17th, this word might convey a wrong impression. What is seen is a ghost-like extension where the ring was. It tapers off sharply, and is perhaps shorter than the ring.

22. to Nov. 20. Between these dates this ghost-like ring was seen on all occasions that the planet was looked at.

Nov. 21. Planet just past meridian. Ring-extension seen to full length on each side. It is brightest close to the planet, and then it is discontinuous. Two cloud-bands on each side of equator. Shadow of ring on planet is a deep brown, and there is a suspicion, but nothing more than a suspicion, of its being divided into two lines. (On Nov. 6 it was noticed that the shadow of Titan was much darker than the ring-shadow.)

25. Ring-extension decidedly discontinuous, and doubtful if full length. The satellites no longer bead the ring-extension, but pass N or S of it.

A rough sketch will give an idea of the relative darkness of the sky, the ring-shadow, cloud-bands, and of the discontinuity of the ring-extension about the dates Nov. 22-25.

Professor Campbell's message reached here on the 28th inst.

- Dec. 1. Ghost-like extension, including discontinuities, is about half the diameter of Saturn on each side, and is discontinuous. It leaves the disc on the south side of the ring-shadow.

Johannesburg:
1907 December 2.

*Observations of Saturn's Ninth Satellite, Phœbe, from Photographs taken with the 30-inch Reflector at the Royal Observatory, Greenwich, in 1907.**(Communicated by the Astronomer Royal.)*

Phœbe has been under observation during the recent opposition of Saturn with the 30-inch reflector, photographs having been obtained whenever possible. In all 16 photographs have been secured on 16 nights, between August 10 and December 6.

From one to two hours' exposure was necessary on account of the faintness of the satellite and its low altitude (5° south of the equator).

The positions of the satellite have been measured on the photographs taken with the reflector with reference to three or four faint comparison stars (of eleventh or twelfth magnitude), symmetrically distributed about the satellite. The positions of these faint comparison stars were then measured relatively to the reference stars (of eighth to ninth magnitude) in the *Astronomische Gesellschaft Catalogue* on photographs (with 30^m and 40^m exposure) taken with the *Astrographic* 13-inch refractor. The field, sensibly free from distortion, being much larger with this telescope than with the reflector, from 16 to 20 reference stars were available on each plate.

As Saturn moved slowly, it was possible to make one reference plate serve for several photographs which were each referred to it. The constants were determined in the usual manner, all the stars on the plate given in the *A.G. Catalogues* being used for this purpose. Right Ascensions and Declinations of Phœbe were then determined and compared with the tabular positions of Saturn after applying to the tabular places the corrections

$$\text{R.A.} + 8.051 \quad \text{Dec.} + 5''.48$$

as determined below.

Observations of Phœbe.

Date and G.M.T.				Apparent R. A.			Apparent Dec.			Phœbe - Saturn		Exp.		
										R.A.	Dec.			
	d	h	m	s	h	m	s	°	'	"	m	s	m	
Aug.	10	12	55	35	23	50	53.23	-3	34	29.7	-0	27.31	-4 22.0	105
	11	12	39	47		50	41.08		36	0.6	0	28.71	4 29.5	133
	18	12	39	10		49	7.84		47	44.6	0	38.25	5 39.8	143
	19	12	53	50		48	53.36		3	49 32.2	0	39.62	5 50.1	120
	29	11	4	59		46	19.31		4	8 4.7	0	52.53	7 22.6	93
Sept.	2	10	56	11		45	12.25		15	54.4	0	57.50	7 55.9	54
	9	11	45	18		43	9.46		30	1.9	1	5.68	8 53.6	107
Oct.	10	11	47	20		42	51.68		4	32 2.2	1	6.74	9 0.2	70
	2	10	36	20		36	21.70		5	14 36.1	1	27.68	11 16.1	90
	4	10	52	26		35	47.97		18	7.7	1	29.11	11 24.7	120
	8	10	44	28		34	42.92		24	51.1	1	31.83	11 40.2	53
	12	9	1	36		33	41.99		31	1.8	1	34.22	11 52.4	90
Dec.	30	8	33	44		29	55.18		52	45.3	1	40.62	12 18.1	100
	3	6	34	27		28	4.66		56	56.9	1	33.00	10 45.9	121
	5	6	35	9		28	12.86		55	35.8	1	31.77	10 36.3	120
	6	6	45	38	23	28	17.69		5	54 49.7	-1	31.04	-10 30.0	90